

AMENDMENTS TO THE CLAIMS:

Please cancel claims 1, 35 and 42–43 without prejudice. Please amend the remaining claims as follows, substituting any amended claim(s) for the corresponding pending claim(s):

1 1. (Canceled)

1 2. (Canceled)

1 3. (Canceled)

1 4. (Canceled)

1 5. (Canceled)

1 6. (Canceled)

1 7. (Canceled)

1 8. (Canceled)

ATTORNEY DOCKET NO. 93-C-077C1 (STMI01-93077)
U.S. SERIAL NO. 09/712,827
PATENT

1 9. (Canceled)

1 10. (Canceled)

1 11. (Canceled)

1 12. (Canceled)

1 13. (Canceled)

1 14. (Canceled)

1 15. (Canceled)

1 16. (Canceled)

1 17. (Canceled)

1 18. (Canceled)

1 19. (Canceled)

1 20. (Canceled)

1 21. (Canceled)

1 22. (Canceled)

1 23. (Canceled)

1 24. (Canceled)

1 25. (Canceled)

1 26. (Canceled)

1 27. (Canceled)

1 28. (Canceled)

1 29. (Canceled)

1 30. (Canceled)

1 31. (Canceled)

1 32. (Canceled)

1 33. (Canceled)

1 34. (Canceled)

1 35. (Canceled)

1 36. (Currently Amended) ~~The~~ A fabrication method of claim 35, wherein the step of
2 comprising the steps of:

3 forming a dielectric structure over a contact region ~~further comprises~~ the dielectric structure
4 comprising:

5 a first layer formed from silicon nitride;

6 a second layer overlying the first layer and formed from borophosphosilicate glass,

7 wherein borophosphosilicate glass may be selectively etched with respect to the silicon
8 nitride; and

9 forming a third layer underlying the first layer and formed from a silicate glass doped
10 with a gettering agent;

11 forming the first layer of silicon nitride; and

12 forming the second layer of borophosphosilicate glass

13 forming and patterning a resist layer over the dielectric structure;

14 selectively etching the second layer through an opening through the patterned resist layer
15 utilizing an etch which is selective of the first material over the second material; and

16 without stripping the resist layer, etching the dielectric structure through the opening within
17 the patterned resist layer and any etched region within the second layer to form a contact opening
18 extending through the dielectric structure and exposing the contact region.

1 37. (Currently Amended) The method of claim ~~1~~36, wherein the step of selectively etching the
2 second layer through an opening through the patterned resist layer utilizing an etch which is selective
3 of the first material over the second material further comprises:

4 etching an opening through the second layer.

1 38. (Previously Added) The method of claim 37, wherein the step of etching an opening through
2 the second layer further comprises:

3 utilizing a relatively isotropic etch process to etch the opening through the second layer,
4 wherein the opening through the second layer undercuts the patterned resist layer.

1 39. (Previously Added) The method of claim 37, wherein the step of etching an opening through
2 the second layer further comprises:

3 utilizing a wet etch process to etch the opening through the second layer.

1 40. (Previously Added) The method of claim 37, wherein the step of etching the dielectric
2 structure through the opening within the patterned resist layer and any etched region within the
3 second layer to form a contact opening extending through the dielectric structure and exposing the
4 contact region further comprises:

5 utilizing a relatively anisotropic etch process to etch a remainder of the opening extending
6 through the dielectric structure through the opening within the patterned resist layer.

1 41. (Previously Added) The method of claim 37, wherein the step of etching the dielectric
2 structure through the opening within the patterned resist layer and any etched region within the
3 second layer to form a contact opening extending through the dielectric structure and exposing the
4 contact region further comprises:

5 utilizing a plasma etch process to etch a remainder of the opening extending through the
6 dielectric structure through the opening within the patterned resist layer, the patterned resist layer
7 masking the plasma etch process.

1 42. (Canceled)

1 43. (Canceled)

1 44. (Currently Amended) ~~The~~An intermediate integrated circuit structure ~~of claim 43,~~
2 comprising:

3 a substrate including a contact region;

4 a dielectric structure over the substrate, the dielectric structure comprising:

5 a first layer formed from a first material;

6 a second layer overlying the first layer and formed from a second material which may
7 be selectively etched with respect to the first material; and

8 a third layer underlying the first layer and formed from a material different than the
9 first material;

10 an opening through the dielectric structure and exposing the contact region, the opening
11 including

12 a first portion extending through the second layer having sloped or concave sidewalls,

13 and

14 a second portion extending through the first layer and having substantially vertical
15 sidewalls; and

16 a patterned resist layer overlying the dielectric structure, the patterned resist layer having an
17 opening therethrough over the opening through the dielectric structure.

18 wherein the first layer is formed of silicon nitride, the second layer is formed of
19 borophosphosilicate glass, and the third layer is formed of a silicate glass doped with a gettering
20 agent.

1 45. (Currently Amended) The intermediate integrated circuit structure of claim ~~43~~44, wherein
2 the first portion of the opening through the dielectric structure undercuts the patterned resist layer.

1 46 (Currently Amended) The intermediate integrated circuit structure of claim ~~43~~44, wherein
2 the opening through the dielectric structure has a Y-shaped profile.

1 47. (Currently Amended) The intermediate integrated circuit structure of claim ~~43~~44, wherein
2 the opening through the dielectric structure is wider within the first portion than the opening through
3 the patterned resist layer.

1 48. (Currently Amended) The intermediate integrated circuit structure of claim ~~43~~44, wherein
2 the opening through the dielectric structure has a width within the second portion approximately
3 equal to a width of the opening through the patterned resist layer.

1 49. (Currently Amended) A method of forming a contact opening, comprising:

2 forming a dielectric structure over a contact region, the dielectric structure comprising:

3 a first layer formed from a first material; ~~and~~

4 a second layer overlying the first layer and formed from a second material which may
5 be selectively etched with respect to the first material; and

6 a third layer underlying the first layer and formed from a third material different from
7 the first material;

8 forming and patterning a resist layer over the dielectric structure;

9 selectively etching the second layer through an opening through the patterned resist layer
10 utilizing a relatively isotropic etch process which is selective of the first material over the second
11 material and which undercuts the patterned resist layer in an etched region formed by the relatively
12 isotropic etch process; and

13 without stripping the resist layer, etching the dielectric structure, utilizing a relatively
14 anisotropic etch process, through the opening within the patterned resist layer and the etched region
15 within the second layer to form a contact opening extending through the dielectric structure and
16 exposing the contact region.

1 50. (Previously Added) The method of claim 49, wherein the step of selectively etching the
2 second layer through an opening through the patterned resist layer utilizing a relatively isotropic etch
3 process which is selective of the first material over the second material and which undercuts the
4 patterned resist layer in an etched region formed by the relatively isotropic etch process further
5 comprises:

6 etching an opening through the second layer utilizing the first layer as an etch stop.

1 51. (Previously Added) The method of claim 50, wherein the step of selectively etching the
2 second layer through an opening through the patterned resist layer utilizing a relatively isotropic etch
3 process which is selective of the first material over the second material and which undercuts the
4 patterned resist layer in an etched region formed by the relatively isotropic etch process further
5 comprises:

6 wet etching the opening through the second layer utilizing hydrofluoric acid, wherein the
7 second layer is formed of a borophosphosilicate glass.

1 52. (Previously Added) The method of claim 50, wherein the step of etching the dielectric
2 structure, utilizing a relatively anisotropic etch process, through the opening within the patterned
3 resist layer and the etched region within the second layer to form a contact opening extending
4 through the dielectric structure and exposing the contact region further comprises:

5 plasma etching a remainder of the opening through the dielectric structure through the
6 opening through the patterned resist layer and through the opening through the second layer.

1 53. (Previously Added) The method of claim 52, wherein the step of plasma etching a remainder
2 of the opening through the dielectric structure through the opening through the patterned resist layer
3 and through the opening through the second layer further comprises:

4 masking the plasma etching process with the patterned resist layer.